Space Weather Forecast

Issued on Saturday, 18 November 2023 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of of Moderate class flares throughout the period. Slight chance G1/Minor Geomagnetic Storm late Day 2 or early Day 3 (19-20 Nov).
Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Moderate over the past 24 hours, with the background level X-ray flux gradually increasing to Common class levels. The largest flare was a low level Moderate class flare, thought to originate from a region just beyond the northeast limb. There are three regions on the visible disc. One region in the southwest is relatively magnetically simple and will soon rotate beyond the western limb. The largest region on the disc continues to emerge from the eastern limb and is showing signs of development on its trailing portion. The only other region on the visible disc is newly emerging in the northeast. All regions appear to be currently stable but hard to analyse, due to their proximity to the limbs.

There have been several Coronal Mass Ejections (CMEs) observed on imagery over the last 24 hours, a filament lift-off from the southwest may have an Earth-directed component but awaits modelling by Enlil

Solar Wind / Geomagnetic Activity: Solar winds, as measured by ACE and DSCOVR at L1, have remained at slow-ambient levels throughout, around 300-350 km/s, and are currently about 300km/s. Density has largely remained below average, with a brief period at average levels around 18/0500 UTC. The strength of the magnetic field was weak throughout, while the important north-south component has also been weak and fluctuating, although was initially southward directed. The resulting geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to be Low, but with a chance of isolated Moderate class flares emanating from the region on the southeast of the disc or new or returning regions that are expected to rotate onto the visible disc through the forecast period.

Solar Wind / Geomagnetic Activity: The Coronal Mass Ejection (CME) associated with a filament eruption on 16/0100 UTC may reach Earth late Day 2 (19 Nov) or early Day 3 (20 Nov), but confidence is low regarding this and any geomagnetic response.

The solar wind is expected to remain at predominantly background levels, perhaps increasing to slightly elevated from late Day 1 due to weak fast stream enhancement from a narrow coronal hole feature in the western hemisphere.

Geomagnetic activity is expected to be Quiet (Kp 0-2) at first with Unsettled (Kp 3) periods increasingly likely from late Day 1 to Day 3 (18-20 Nov). Slight chance of Active (Kp 4) intervals or an isolated G1/Minor Geomagnetic Storm (Kp 5) late Day 2 (19 Nov) or early Day 3 (20 Nov) associated with the potential arrival of a CME. Low confidence in details surrounding this feature.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	15	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	40	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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